SYNTHESIS RATE OF PHOSPHOLIPIDS AND CYTOCHROMES b_5 AND P_{450} IN THIAMINE-DEFICIENT RATE AFTER TREATMENT WITH THIAMINE

H.J. Röthig, H. Reinauer and S. Hollmann

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16. Abstract

The content and synthesis rate of phospholipids in heart, liver, brain and kidney, as well as the content of cytochromes b_5 and P_{450} in the liver of thiamin-deficient rats was investigated.

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SYNTHESIS RATE OF PHOSPHOLIPIDS AND CYTOCHROMES b_5 AND P_{450} IN THIAMINE-DEFICIENT RATS AFTER TREATMENT WITH THIAMINE

H. J. Röthig, H. Reinauer and S. Hollmann

Supplementing earlier investigations on the synthesis rate /1562* of ribonucleic acids and proteins in various cell fractions of rat organs, the content and synthesis rate of phospholipids in heart, liver, brain and kidney, as well as the content of cytochromes b_5 and P_{450} in the liver of thiamin-deficient rats was investigated before and after thiamine treatment. The rate of phospholipid synthesis was measured by means of the relative specific activity of the lipid phosphorus. The synthesis rates for lecithin and phosphatidylethanolamine were determined after separating the phospholipids with thin layer chromatography. The synthesis rate of the phospholipids is very low in heart muscle and brain. It is significantly increased in the livers of deficient animals, while the synthesis rate is reduced in the kidneys. After administration of thiamin, the synthesis rate for the phospholipids rises first in the microsomes. A maximum is reached after 14 hours in heart muscle, after 32 hours in the liver, and after more than 64 hours in thekidney. There is no systematic difference between the synthesis rates for phosphatidyl choline and phosphatidylethanolamine. Cytochrome b_5 and P_{450} are reduced to 30%, in comparison with control animals, in the microsomes of the livers of deficient animals. After giving thiamine, the microsomal cytochrome content rises, reaching approximately normal values only 8 hours after thiamine administration. The time course of phospholipid synthesis in the microsome fraction of the liver is related to protein, RNA, cytochrome b_5 and cytochrome P_{450} synthesis.

*Numbers in the margin indicate pagination in the original foreign text.